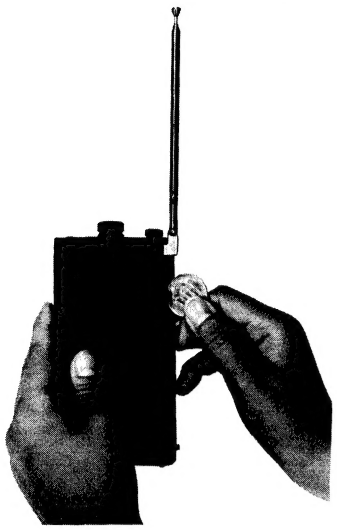
SANYO

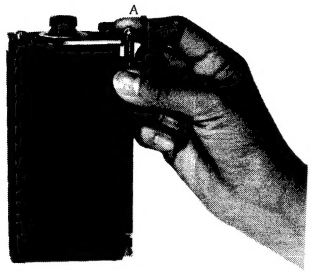
SANYO
AM/FM PORTABLE RADIO
RP 5110 (SS/Z)
SERVICE MANUAL

A PRODUCT OF SANYO ELECTRIC CO., LTD.

SPECIFICATIONS

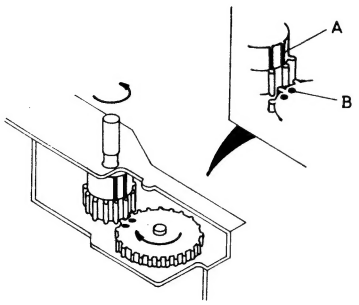
Frequency Ranges:	MW 510 – 1605 KHz FM 88 – 108 MHz
Intermediate Frequency:	AM 455KHz (SS), 460KHz (Z) FM 10.7 MHz
IC:	IC301 AN253BB FM/AM IF, Audio Amplifier
Transistors:	Q101 2SC930D FM RF Amplifier Q102 2SC930E FM Converter Q103 2SC929E AM Converter Q301 2SC536G FM/AM Indicator Q302 2SC536G FM/AM Indicator Q701 2SD187Br Audio Output Q702 2SB187Br Audio Output
Diodes:	D102 1S188FM FM AGC D301 DS442 AM Detector D302 DS442 Tuning D303 DS442 Tuning D304 SLP114B Tuning D305 1S188FM FM Discriminator D306 1S188FM FM Discriminator
Sensitivity (for 50mV output):	MW 160μV/m FM 10μV (S/N = 30dB)
Power Output:	Maximum 200mW Undistorted 150mW
Power Source:	DC; 4.5V For 1.5V "AA" Size x 4
Current Drain:	No Signal 30mA Maximum 120mA
Speaker:	5.7 cm Permanent Dynamic Speaker 8 ohm
Dimensions:	62mm (W) x 126mm(H) x 33mm(D)
Weight (without batteries):	240 g (approx.)





How to open the cabinet

1. Turn the rod antenna upward.
2. Put the edge of a coin into the slit between the cabinet and the rear cover. Twist the coin slowly, and the rear cover will unlock and open slightly (about 1/5" or 5mm).
3. Turn the rod antenna downward.
4. Unlock the top part of the rear cover, pushing it gradually in the arrow (A)-marked direction. Then, the rear cover will separate from the cabinet.
5. Be careful not to damage the lead wires when closing the rear cover.



How to attach the tuning shaft

Turn the tuning shaft counterclockwise and the variable capacitor clockwise as far as they move. Match A and B, as illustrated, and immobilize the tuning shaft, using an E-ring.

ALIGNMENT PROCEDURES

GENERAL ALIGNMENT CONDITIONS

1. The position of volume control is at maximum position.
2. Signal input must be kept as low as possible to avoid voerload.
3. Use an output meter of the highest possible sensitivity.
4. Standard modulation is 400 Hz at 30% amplitude (for AM) and 22.5 kHz deviation (for FM).

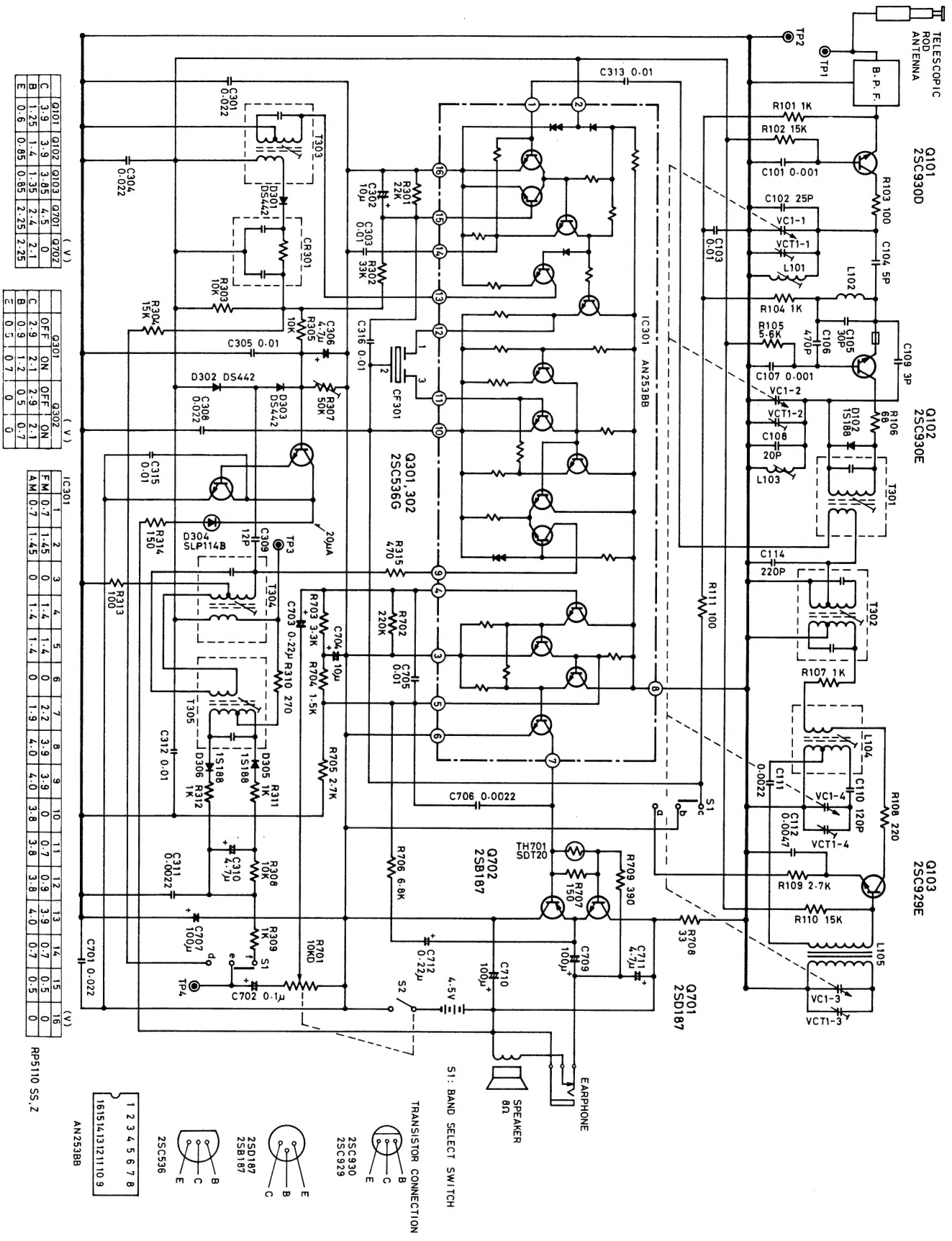
AM BAND – Band selector switch in AM position.

Step	Connection of Signal Gen.	Input Signal Frequency	Dial Setting of Radio	Connection of Output Meter	Adjust	Remarks
1	Loop Antenna	455 kHz (SS) 460 kHz (Z)	Lowest End	Across Speaker	IFT T302, 303	Adjust for Maximum
2	Same	540 kHz	540 kHz	Same	Osc. Coil L104	Same
3	Same	1600 kHz	1600 kHz	Same	Osc. Trim VCT1-4	Same
4	Same	600 kHz	600 kHz	Same	Ant. Coil L105	Same
5	Same	1400 kHz	1400 kHz	Same	Ant. Trim. VCT1-3	Same
	Repeat steps 2 thru 5 to obtain maximum sensitivity.					

FM BAND-Band selector switch in FM position

Step	Connection of Signal Gen.	Input Signal Frequency	Dial Setting of Radio	Connection of Meter or Oscilloscope	Adjust	Remarks
1	Connect Sweep Marker Generator to R103, VC(E)	10.7 MHz	Lowest End	Connect scope input cable thru network to TP3, T304 (E)	IFT T301, 304	Adjust for maximum sensitivity with symmetrical curve.
2	Same	10.7 MHz	Lowest End	Connect scope input cable thru network to TP4, T303 (E)	IFT T305	Adjust for symmetrical "S" cruve.
3	Connect Signal Generator to TP1, 2	88.0 MHz	88.0 MHz	Connect V.T.V.M. across speaker	Osc. Coil L103	Adjust for maximum
4	Same	108.0 MHz	108.0 MHz	Same	Osc. Trimmer VCT1-2	Same
5	Same	90 MHz	90 MHz	Same	RF Coil L101	Same
6	Same	106 MHz	106 MHz	Same	RF Trimmer VCT1-1	Same
	Repeat steps 1 thru 6 to obtain maximum sensitivity.					

SCHEMATIC DIAGRAM



(V)

	Q101	Q102	Q103	Q701	Q702
C	3.9	3.9	3.85	4.5	0
B	1.25	1.4	1.35	2.4	2.1
E	0.6	0.85	0.85	2.25	2.25

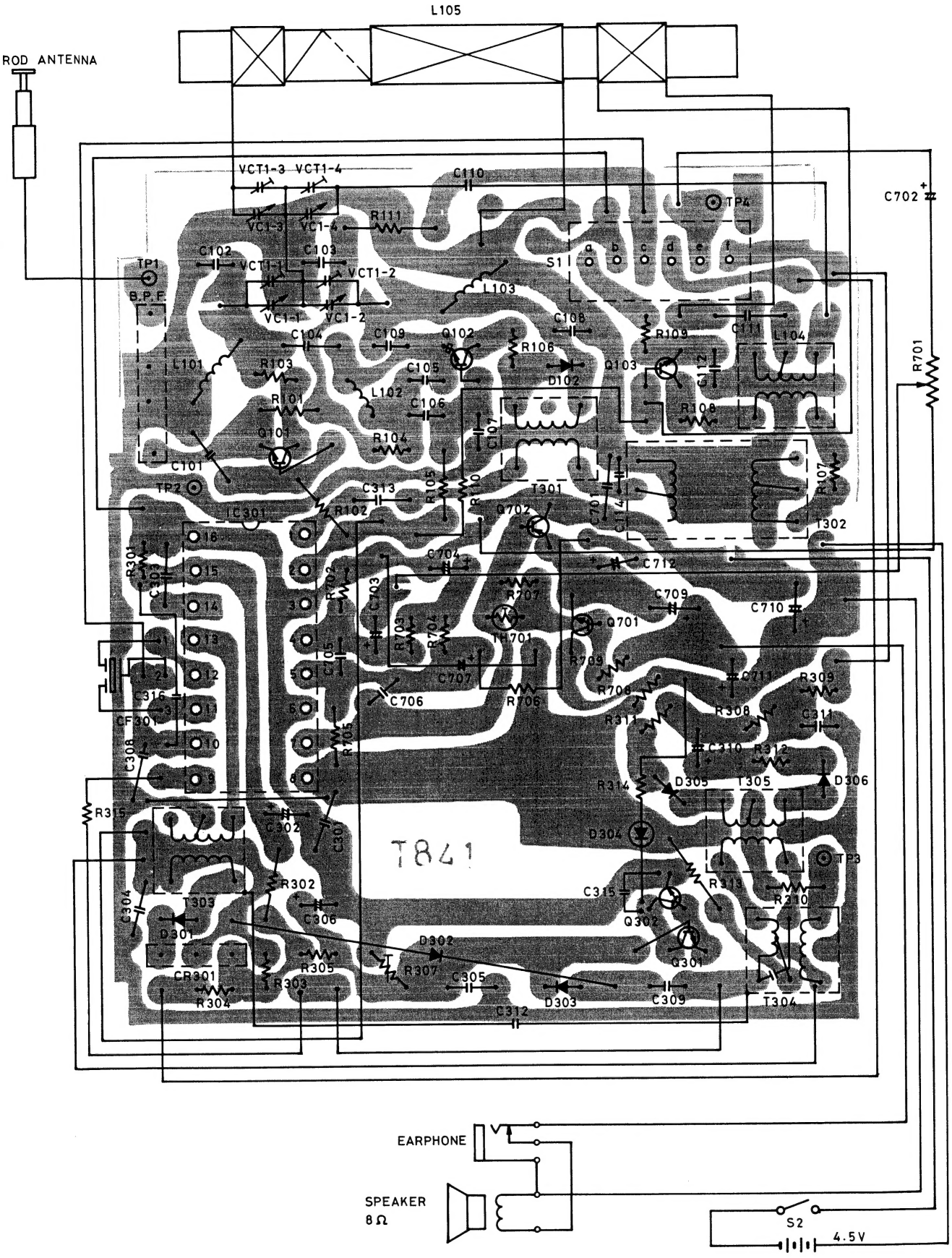
(V)

	Q301		Q302	
	OFF	ON	OFF	ON
C	2.9	2.1	2.9	2.1
B	0.9	1.2	0.5	0.7
E	0.5	0.7	0	0

IC301 (V)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FM	0.7	1.45	0	1.4	1.4	0	2.2	3.9	3.9	0	0.7	0.9	3.9	0.7	0.5	0
AM	0.7	1.45	0	1.4	1.4	0	1.9	4.0	4.0	3.8	3.8	3.8	4.0	0.7	0.5	0

WIRING DIAGRAM



PARTS LIST

Schematic Location	Part No.	Description	Q'ty
PACKING			
	141-6-144T-29200	Pad	1
		Polyethylene Bag, 100 x 200mm, Set	1
	141-6-315T-02101	Sleeve SS	1
	141-6-411T-76200	Instruction Book SS	1
	141-6-315T-02102	Sleeve Z	1
	141-6-411T-76201	Instruction Book Z	1
	141-2-181T-08801	Case	1
		Polyethylene Bag, 100 x 150mm, Case	1
CABINET & CHASSIS			
	141-0-111T-272911	Cabinet Assembly	1
	141-0-126T-172912	Back Lid Assembly Z	1
	141-0-126T-172911	Back Lid Assembly SS	1
	141-2-128T-09300	Battery Lid	1
	141-2-164T-13800	Slide Knob, Band	1
		Cover, 13ϕ x 5ϕ, Slide Knob	1
	141-2-163T-30900	Rotary Knob, Volume	1
	141-0-163T-310911	Rotary Knob Assembly, Tuning	1
	141-2-311T-21300	Chassis	1
	141-2-566T-04200	Tuning Shaft	1
	141-2-581T-03900	Gear, Tuning Shaft	1
	141-2-581T-04000	Gear, Tuning Capacitor	1
	141-2-421T-18100	Special Screw, Gear	1
	123-2-421R-11000	Special Screw, Tuning Capacitor mtg.	2
ELECTRICAL PARTS			
Q101		Transistor, 2SC930	1
Q102		Transistor, 2SC930	1
Q103		Transistor, 2SC929	1
Q301,302		Transistor, 2SC536	2
Q701		Transistor, 2SD187	1
Q702		Transistor, 2SB187	1
IC301		Integrated Circuit, AN253	1
D102,305, 306		Diode, 1S188FM	3
D301,302, 303		Diode, DS442	3
D304		Diode, SLP114B	1
TH701		Thermistor, SDT20	1
L101	4-265R-11300	VHF Coil	1
L102,106	4-265R-05000	VHF Coil	2
L103	4-265R-12000	VHF Coil	1
L104	4-258T-13200	Oscillator Coil	1
L105	4-257T-16971	Antenna Coil, AM	1
T301	4-256T-05140	Transformer, FM 1st IF	1
T302	4-256T-05340	Transformer, AM 1st IF	1
T303	4-256T-03740	Transformer, AM 2nd IF	1
T304	4-256T-07540	Transformer, FM 2nd IF	1
T305	4-256T-04040	Transformer, FM 3rd IF	1
BPF	4-253T-08700	RF Filter	1
CR301	4-227T-01500	CR Pack	1
CF301	4-256T-80400 4-256T-80471 4-256T-80472 4-256T-80473 4-256T-80474	or IF Filter, FM	1
	4-151T-20000	Speaker, 8 ohm	1
S1	4-231T-54300	Switch, Band Select	1
	4-244T-02000	Telescopic Rod Antenna	1
	123-2-472R-00400	Lug, Rod Antenna	1
	4-152R-10896	Earphone	1
	4-235R-17201	Socket, Earphone	1
	123-2-471R-10400	Bead Core, Q102 mtg.	1
	4-226T-841911	P.C.B., Assembly	1

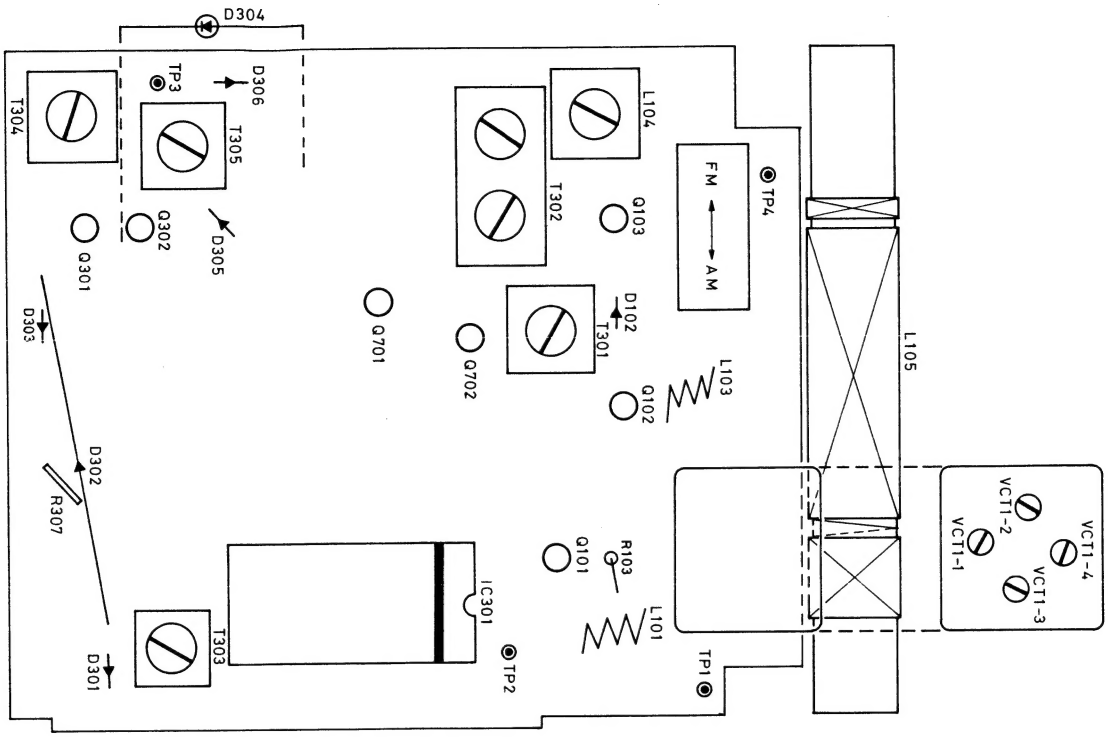
Schematic Location	Part No.	Description	Q'ty
RESISTORS			
All Resistors are Carbon P-type, ±10% unless otherwise noted.			
R101		1K ohm, 1/4W	1
R705		2.7K ohm, 1/4W	1
R105		5.6K ohm, 1/4W	1
R102		15K ohm, 1/4W	1
R302		33K ohm, 1/4W	1
R708		33 ohm, 1/8W	1
R103,111, 313		100 ohm, 1/8W	3
R108		220 ohm, 1/8W	1
R314, 707		150 ohm, 1/8W	2
R310		270 ohm, 1/8W	1
R709		390 ohm, 1/8W	1
R315		470 ohm, 1/8W	1
R107,311, 312, 309 104		1K ohm, 1/8W	5
R704		1.5K ohm, 1/8W	1
R109		2.7K ohm, 1/8W	1
R703		3.3K ohm, 1/8W	1
R706		6.8K ohm, 1/8W	1
R303,305, 308		10K ohm, 1/8W	3
R110, 304		15K ohm, 1/8W	2
R301		22K ohm, 1/8W	1
R702		220K ohm, 1/8W	1
R106		680 ohm, 1/8W	1
R701	4-222T-48200	Variable Resistor, 10K ohm, "D"	1
R307	4-222T-48300	Variable Resistor, 50K ohm, "B"	1
CAPACITORS			
C109		Ceramic, 3pF, ±0.25pF, 50V	1
C104		Ceramic, 5pF, ±0.5pF, 50V	1
C309		Ceramic, 12pF, ±10%, 50V	1
C108		Ceramic, 20pF, ±10%, 50V	1
C102		Ceramic, 25pF, ±10%, 50V	1
C105		Ceramic, 30pF, ±10%, 50V	1
C114		Ceramic, 220pF, ±10%, 50V	1
C101,107		Ceramic, 0.001μF, +80 -20%, 50V	2
C111,311, 706		Ceramic, 0.0022μF, ±20%, 25V	3
C313		Ceramic, 0.01μF, +80 -20%, 25V	1
C301,304, 308,701		Ceramic, 0.022μF, ±20%, 12V	4
C106		Ceramic, 470pF, ±20%, 50V	1
C112		Mylar, 0.0047μF, ±20%, 50V	1
C110		Styrol, 120pF, ±5%, 50V	1
C303,305, 103,312, 705,315, 316		Ceramic, 0.01μF, ±20%, 25V	7
C703,712		Electrolytic, 0.22μF, 10V	2
C702		Electrolytic, 0.1μF, 10V	1
C306,310, 711		Electrolytic, 4.7μF, 25V	3
C302,704		Electrolytic, 10μF, 16V	2
C707,709, 710		Electrolytic, 100μF, 6.3V	3
VC1,VCT1	4-224T-06371	Tuning Capacitor	1

MARKET IDENTIFICATION BY MODEL NUMBER SUFFIX

RP 5110SS: Model for general market

RP 5110Z: Model for Europe market

NOTES: 1. Parts orders must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.



How to adjust the sensitivity of LED for tuning

Do as instructed below:

- Set the band switch to FM.
- Reduce the signal level to zero.
- Adjust the variable resistor R307 until current flowing to D304 becomes 20μA.